The definition of a necessary and sufficient information accumulation level to substantiate a choice of enterprise's market opportunities directions development

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The basic rules of the theory-methodical approaches to definition of a necessary and sufficient information accumulation level for marketing decisions' on a substantiation of the enterprise's market opportunities development projects effective acceptance are set forth.

The acceptance of the rational decisions by an estimation and choice of the projects of enterprise's market opportunities development demands the appropriate information base's presence, which is necessary to reduce a degree of uncertainty and risk, caused by it, and to increase the accepted decisions' validity. But increase of persons' knowledge level is connected to significant expenses of the additional information's obtaining which can exceed possible benefits from more exact decisions' substantiation. Therefore, to determine the quantity of the information which is really necessary to accept the substantiated decision, it is necessary to compare marginal benefits to expected expenses on its obtaining.

The question of market researches information maintenance directed on a search and a choice of market opportunities directions development, demands a significant attention to be paid. There are many publications devoted to this problem, among them it is necessary to underline the importance of [1, 2]. The analysis shows that the problems of information base's for variants of development choice formation are urgent, the existing publications consider the different parts of these problems. But questions of an economic substantiation of a necessary and sufficient level of information accumulation (its volumes and kinds) are not covered sufficiently, that does not allow to optimize procedure of a choice of variants of development

of the concrete enterprises which are in adequate situations in the market, results in the mistaken decisions with all the consequences following.

In view of stated, the purpose of the given research is the development of the theory-methodical approaches to definition of a necessary and sufficient level of accumulation of the information for acceptance of the proved marketing decisions at the choice of directions of development of enterprise's market opportunities.

At first we shall determine, that the marginal quantity (Qm) and marginal price (Pm) of the necessary information is determined by a point in which the expected marginal benefit curve (Bm) crosses the expected expenses (Ex), connected with its reception (fig. 1) [3]. If the expected benefit of the information purchase exceeds expected marginal expenses (B≥Ex), such information will be necessary for getting. If on the contrary (B < Ex), it is necessary to refuse the information purchase, as the expected meaning of result in conditions of uncertainty in this case will be higher, than in conditions of certainty.

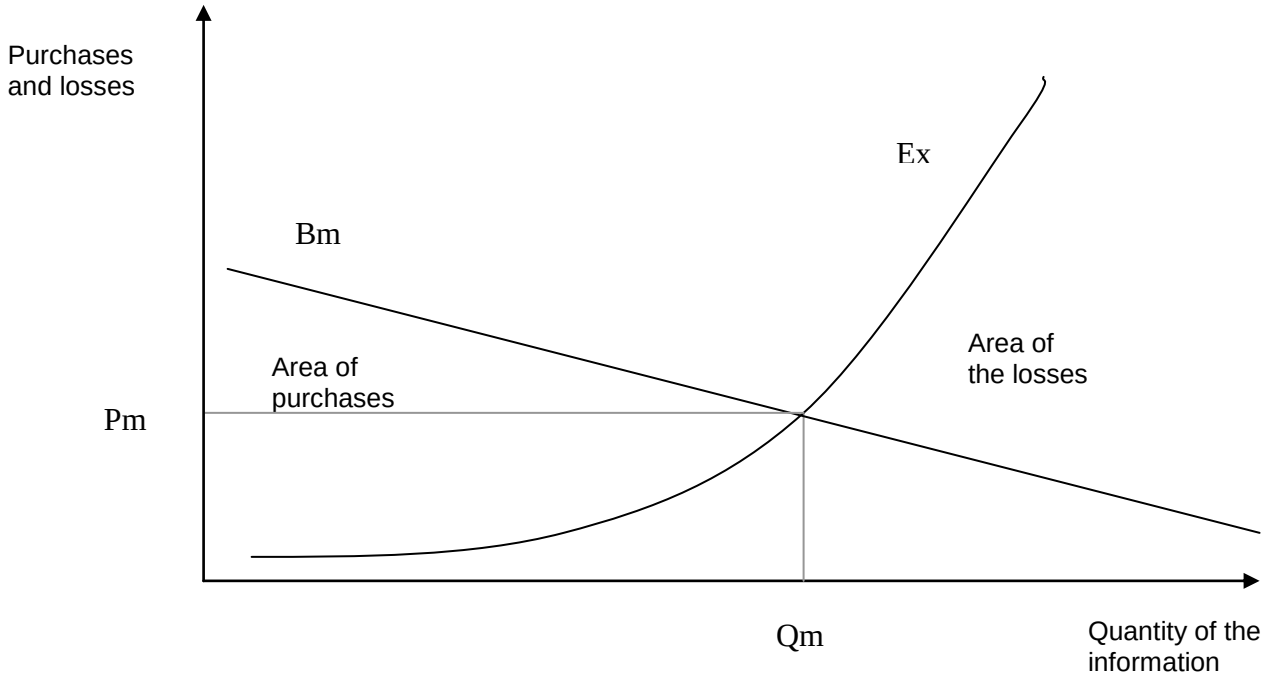

Fig. 1— Definition of the necessary information optimum volume

According to [4] the limiting cost of the complete information is determined as a difference between the expected results of the certain event or decision, expressed in the cost form, which is executed or accepted in conditions of complete knowledge (Rc) and expected results of the same event or decision in conditions of uncomplete knowledge (Ru).

$$C_{lim} \leq Rc - Ru \quad (1)$$

If the information costs are more then Bm, its purchase, even at the absolutely exact forecast, will reduce the size of result, for example, profit, which receive in conditions of certainty, in comparison with profit, which receive in conditions of uncertainty. In this case, purchase of additional information is irrationally.

But there are also other aspects of search of the necessary information. It is possible to collect the information, which will not contain the really necessary data. In this case there will be a large error of search of the information and according to low efficiency of search. In other words, the expenses for search of the information will be not efficient.

The efficiency of search of the information can be appreciated with the help of parameters of an error of search and completeness of search, which calculate under the following formulas.

$$П_{пг} = 1 - \frac{К_р}{К_о}, \quad (2)$$

$$П_{пл} = \frac{К_р}{К_{рм}}, \quad (3)$$

where Ппг - error of search; Ппл - completeness of search; Кр - volume given of the relevant information; То - general volume of the given information; Крм - volume of the relevant information in its general set.

The sizes Кр, Ко, Крм can be measured by quantity of the documents or in standard units, which are accepted for measurement of quantity of the information Byte, Kilobyte, Mbyte, Gbyte and т. д.

In a fig. 2 [5] sizes Ппг, Ппл are submitted as attitude of crossing area to each of two allocated areas.

According to the formulas (2-3), the efficiency of search of the information the above , than completeness of search and is less an error of search. In other words, the areas, allocated

with circles in a fig. 2, in an ideal should be imposed one on one, but practically is not achievable.

It is necessary to establish boundary meaning of completeness of search and error of search (these parameters, as it follows from the formulas 2-3, are in back proportional dependence - increase one conducts to reduction another), as the increase of completeness of search results in increase of cost of the information. That is such meaning of completeness of search is necessary to find which will be acceptable with the point of view of person, which makes a decision, but at the same time expenses but its achievement should not exceed the certain size. As follows from a fig. 1, the information should be accumulated so long as the expenses on its purchase less or are equal to expected boundary benefits from possession by it. And, such estimations should be carried out before realization of search of the information, because the estimation should carry the character of the forecast. But on the moment of a beginning of the tax of the information such forecast to make very difficultly, because too high level of uncertainty.

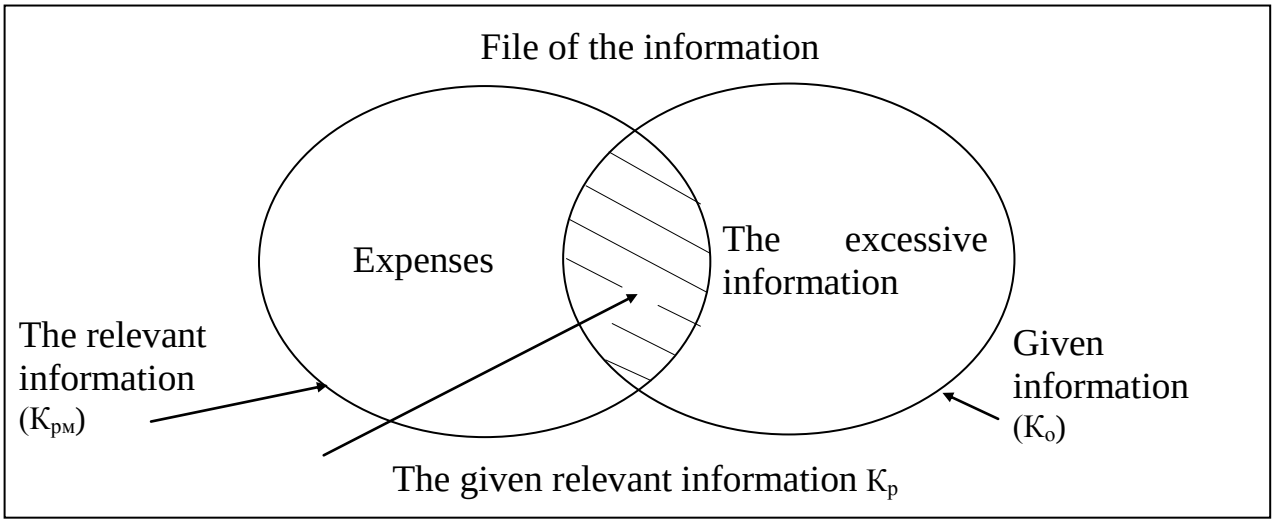

Fig. 2 — The circuit of the information search error occurrence

As a first approximation dependence between size of expenses for purchase of the additional information and completeness of its accumulation, which is determined in factor Ипл, (3), can be expressed by the following differential equation:

$$\frac{dBm}{d\Pi_{пл}} = Bm + Bm \cdot a \cdot \Pi_{пл}, \qquad (4)$$

where a - factor of proportionality.

For the decision of this equation we shall transform it to the following kind.

$$\frac{dBm}{Bm} = (1 + a \cdot \Pi_{пл}) \cdot d\Pi_{пл}. \qquad (5)$$

The solving of the equation (5).

$$\ln|Bm| = \Pi_{пл} + a \cdot \frac{\Pi_{пл}^2}{2} + \ln|C_1|, \text{ or after transformations}$$

$$Bm = C_1 \cdot e^{\frac{a \cdot \Pi_{пл}^2}{2} + \Pi_{пл}}. \qquad (6)$$

The marks of the module are lowered, as the sizes accept only positive meanings.

The dependence between boundary benefits from use of the information and its accuracy, which is determined in factor Ппг (2), can be expressed by the following differential equation:

$$\frac{dB}{d\Pi_{пг}} = B - в \cdot \frac{Bг}{\Pi_{пг}}. \qquad (7)$$

where $в$ - factor of proportionality.

Having executed transformations of this equation is similar to transformation (4) in (5) and having solved it rather Вг we have.

$$Bг = \frac{C_2 \cdot e^{\Pi_{пг}}}{\Pi_{пг}^{в}}. \qquad (8)$$

The meanings of constant C1 and C2 can be received if to substitute, accordingly, in (6) and (8) meanings of known sizes (for C1 it Вт and Ппл i, for C2 - Вгi and Ппг i) and to solve these equations rather Вт and Вг.

$$C_1 = \frac{Bm_i}{e^{\frac{a \cdot П_{плi}^2}{2} + Ппл_i}},. \qquad (9)$$

$$C_2 = \frac{Bг_i \cdot Пnг_i^в}{e^{Пnг_i}}. \qquad (10)$$

The meanings of factors *а* and *в* can be received by replacement of sizes *dBm*, $dП_{пл}$, *dBг*, $dП_{пг}$ on *ΔBm*, $ΔП_{пл}$, *ΔBг*, $ΔП_{пг}$ and substitution them in the equation (5) and (7). Further accepting $ΔП_{пл}$= 0,01 and $ΔП_{пг}$=0,01 and using a method of the least squares, we differentiate (5) on *а* and (7) on *в*. Solving the received equations rather *а* and *в* shall find there meanings.

Optimum meanings of sizes Ппл and Ппг is determined from a condition.

Bг-Bm $\rightarrow max$ or

$$\frac{C_2 \cdot e^{П_{пг}}}{П_{пг}^в} - C_1 \cdot e^{\frac{a \cdot П_{пл}^2}{2} + П_{пл}} \rightarrow \max. \qquad (11)$$

Thus the restrictions should be observed.

$$0 \le П_{пг} \le 1,$$
$$0 \le П_{пл} \le 1, \qquad (12)$$
$$Bm \le Bm_{гр,}$$

where $Вт_{гр}$ - limiting size of expenses, which can be allowed by the enterprise on accumulation of the information for filling information base of information system.

The size Вт is determined under the formula (6). The meanings Ппл and Ппг in the equations (11) and (12) concretize by substitution in them of known sizes Кр, Ко, Крм (2-3).

Optimum meanings of sizes Ко, Кр can be found at known meaning Крм, which are possible are to determined as « area of the data and knowledge » about process, a subject or phenomenon with which is called to work information system.

Thus, is developed the basic rules of the theory-methodical approach to definition of a necessary level of accumulation of the information for acceptance of the proved decisions at the choice of directions and variants of development of market opportunities and the more so hardly to estimate the future results.

But in practice it happens difficultly to estimate possible benefits from reception of the additional information, because at a stage which, precedes market researches, it is not yet clear for an estimation of prospects of development of the enterprise, what will be chosen variants of development of market opportunities and the more so hardly to estimate the future results

Also it is heavy to estimate expense for reception of the information. The different stages and investigation phases, with the purpose of a substantiation of optimum variants of development, require the information of a different kind and in different volumes, use different ways of its reception and analysis, which differ on terms of realization, completeness of search, cost of the information etc.

Further it is considered features of information maintenance on stages of process of an estimation and choice of variants of development of the concrete enterprise in existing conditions, with the purpose of reduction of uncertainty at an estimation of expenses on the tax and analysis of the information, in view of prospects of their development further.

The process of an estimation of variants of development of market opportunities follows [6] to consider on stages as system, which consists of the following elements: phase of a concrete stage of acceptance of the decisions - purpose of each stage - information, which is used during decision the tasks of stages - criterions of achievement of the purposes at each stage.

The given system can be submitted as set X, which, in turn, is determined as the Cartesian product of its making sets Xi :

$$X \equiv X_1 \cdot X_2 \cdot X_3 \cdot X_4. \qquad (13)$$

where X1 - set of stages of process; X2 - set of the purposes of stages; X3 - set of the information's kinds; X4 - set of estimated criterions.

Each set characterizes homogeneous elements of system. Accordingly, for each of evaluation stages of variants of development of market opportunities there will be a fair following parity.

$$X^i \equiv X^i_1 \cdot X^i_2 \cdot X^i_3 \cdot X^i_4. \qquad (14)$$

The set $X^i \subset X$ is determined by interrelations between the purposes $X^i_2 \subset X_2$, kinds of the information $X^i_3 \subset X_3$ and estimated criteria $X^i_4 \subset X_4$ for *i* stage to process. Set X^i_1 contains one element - *i* stage of process of an estimation of variants of development of market opportunities.

Filling concrete sense X^i_1, X^i_2, X^i_3, X^i_4, for each of stages we shall receive dependences, which unequivocally will establish the purposes of stages, kinds of the information, which is used at realization of works of the appropriate stages, criteria of an estimation of efficiency of these works.

It will allow to reduce a degree of uncertainty of volumes of the information necessary for acceptance of the proved decisions during a substantiation of the projects of development of the enterprise for stages, will raise accuracy of forecasting of expenses on reception of the information.

In a fig. 3 is submitted model of process of segmentation, which includes the following structural elements: stages of process of segmentation, kinds of the information, criterions, purpose of stages.

In a fig. 3 the coordinates of the purposes of stages of segmentation are shown, and they because of a large size of records are not submitted.

The kinds of the information, which are used at different stages of process, are determined and also the sets of criteria are offered, on which is conducted an estimation of efficiency of performance of works of stages of process. As criterion, accordingly after stages, the following are determined: evaluation stages of opportunities of the enterprise – level of profit, sufficiency of resources, chances in a competition; stages of definition of principles and factors of segmentation, construction of economic-mathematical models, tax and analysis of the information - capacity, level of profit, tendency of growth of a segment; for last stage - all set of estimated criteria (fig. 3).

As the general purposes of stages (they are subject to detailed elaboration) the following are allocated: an estimation of opportunities of the enterprise - to estimate sufficiency of potential of the enterprise for realization of existing market opportunities determine what kinds of production it can to make; definition of principles and reasons of segmentation - to reveal principles, reason and change of the reasons.

Similarly follow to build information models of other stages of process of formation of the target markets and stages of process of development of market opportunities as a whole.

The stated above approach is convenient for formalization of the description of information base for management of development of market opportunities of the enterprises. Each stage of an estimation and choice of variants is considered as system: stages of process - purpose of stages - information necessary for acceptance of the decisions, - estimated criteria. It allows somewhat to lower uncertainty of formation of information base, at the expense of an establishment of unequivocal conformity between ёё by making elements.

For practical realization of the stated approach the problem-oriented packages of the applied programs can be used, for example, relational SDBM such as Open Access or tabulated processors such as Microsoft Excel, which have the built - in tools of processing of above mentioned mathematical dependences.

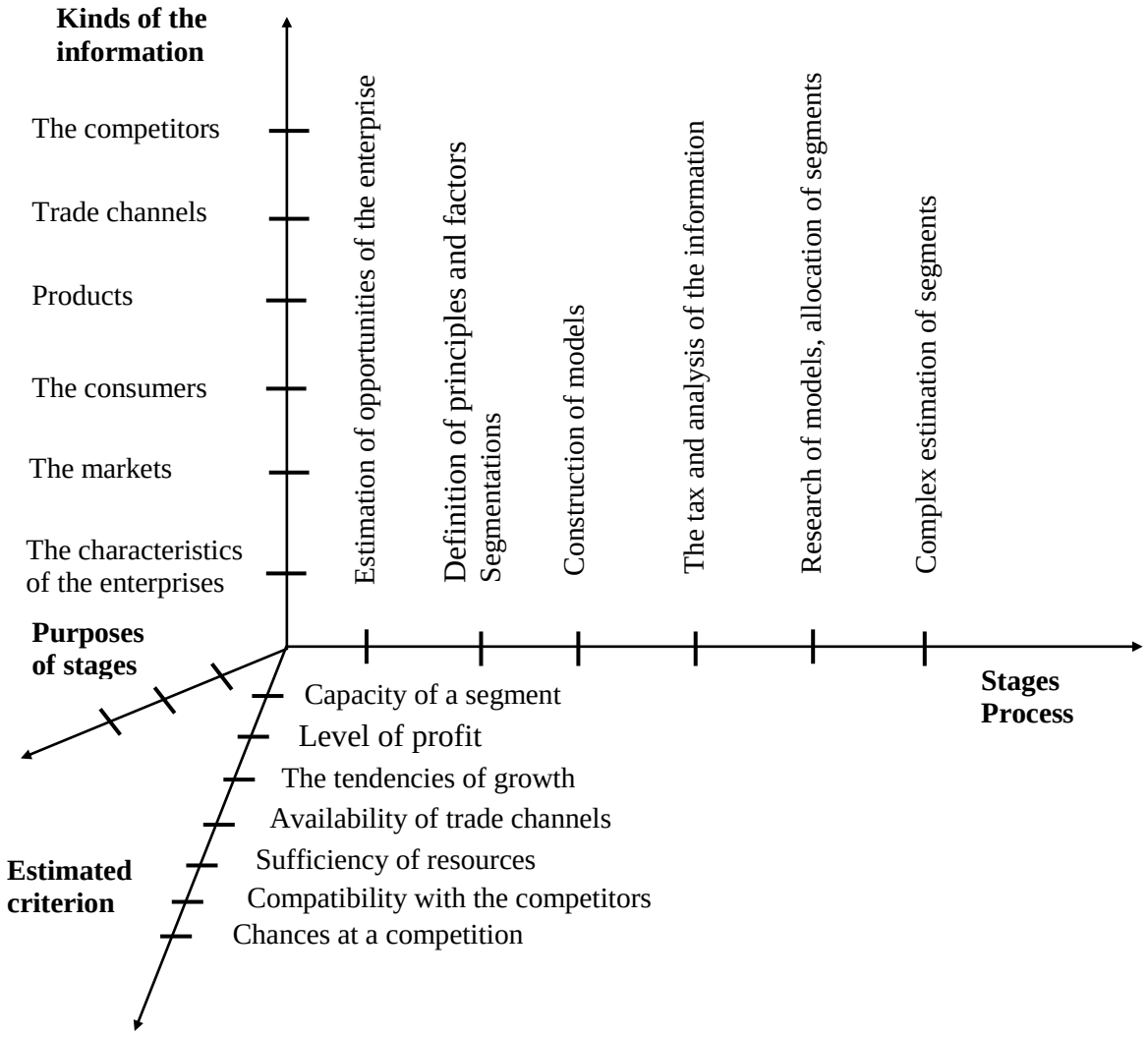

Fig. 3 — The generalized model of segmentation as one of the stages of target market formation

The usage of the received results allows to make practical toolkit, which enables operatively and with a high degree of the validity to carry out works on creation of information base for an estimation and choice of directions of development of market opportunities, to predict expenses on its updating more precisely.

Addressing to the stated above approaches under the decision of problems of definition of a necessary and sufficient level of accumulation of the information with the purpose of information support of process of an estimation of the alternative projects, it is necessary to determine, that the offered mathematical and information models allow in the greater degree

to solve a problem of definition of cost of the information. But the problem of definition of probable benefits from its use is more difficult and requires the further researches.

The author's approach to the decision of this problem we shall consider on an example of definition of an optimum parity between a level of accuracy of a choice of market positions of the enterprise by a method of segmentation and expenses for formation of the target market on the basis of its allocated sites. Let's note, that the accuracy of a choice of market positions determines opportunities of the existence of the managing subject, success of realization of its potential in existing external conditions (in view of the tendencies of their change) with the purpose of maintenance of a long-term survival and development within the framework of the chosen mission.

The high importance of process of market positioning (allocation of target sites of the market for realization of the revealed market opportunities) puts forward also high requirements to accuracy and quality of performance of the appropriate market researches, estimation and interpretation of their results.

In the given context it is necessary to understand accuracy of market positioning as degree of conformity of opportunities of the enterprise to existing conditions of managing in the target market, chosen for their realization, its segments or niches.

The increase of accuracy and quality of market positioning reduces a degree of uncertainty, allows to accept the proved decisions, but it causes sharp increase of expenses at the tax and analysis of the information, and as a whole - increase of expenses at all process of search and allocation of target sites of the market, and also formation of the target market on their base for realization of existing opportunities of development.

For definition of probable benefits from possession of the information it is necessary to execute the forecasts of the future development of events and to estimate probable results (their cost estimation) at a different degree of awareness. It permits to establish dependence of probable results on a degree of awareness about a subject of the decision and its probable consequences (dependence of results on quantity and quality of the initial information). It is necessary also to establish what kinds of the information, what qualities and in what quantity necessary for acceptance of the decisions at different stages of a substantiation of the projects

of development, which will permit to estimate a degree of awareness in cost expression. The considered above approaches (see formulas 1-14 and fig. 2) can be applied for this purpose.

It is obvious, that it is necessary to find the conciliatory proposals between expenses for achievement of the certain level of knowledge and expected results in cost expression. Practically it can be executed by a method of consecutive approximation. To an initial degree of awareness (is estimated by quantity and quality of the information, and also expenses for its reception) it is necessary consistently to add certain gain and calculate expected meanings of result. On one of iterations the total expenses for the information will be balanced with results. Thus, the economically expedient level of awareness will be determined.

We shall consider the basic rules of the approach [7], that permits to find an optimum parity between a level of accuracy of process of search of the target markets (target or segments of niches of the market) method of segmentation and expenses for its achievement. Thus the process of a choice of market positions is considered as multilevel iterative.

According to the given approach of work are carried out on stages:

- account of expenses on search of sites of the market for realization of the revealed market opportunities of development;
- estimation of accuracy of process of search of sites of the market;
- definition of an economically effective level of accuracy of a choice of a position in the market.

In turn, any of stages includes a line of stages. Accordingly, the further consideration we shall conduct on stages, and inside stages - stage by stage.

I. ***The market target sites allocation works expenses' calculations.*** It is necessary, that the calculations were carried out in the following sequence: the concrete purposes defining; it is necessary to solve definition of tasks, which for achievement of these purposes; an estimation of expenses on the decision of these tasks. Their sum will give focused size of expenses on realization of works.

By the purpose of works of the given stage (as is marked above) there is a definition by the enterprise of the place in the market, where the greatest measure can show its comparative

advantages, that is revealing of target segments or niches of the market, and exact forecasting of volumes of selling on them.

The works of the given stage are necessary for carrying out in the following sequence:

- estimation of own opportunities of the enterprise;
- definition of principles (orientation to a product, orientation to the consumer etc.) and factors (specificity of inquiries of the consumers, parameters of products, regions of selling etc.) search of target sites of the market by a method of segmentation;
- construction of a complex of matrix models (functional cards) [8] for allocation and estimation of segments or niches of the market on the consumers, products, basic competitors etc.;
- the tax and analysis of the information, which characterizes the markets of selling;
- allocation of target sites of the market and their complex estimation;
- choice of target segments of the market and manufacturing of the offers for acceptance of the administrative decisions.

We shall consider the purposes of concrete stages and tasks, which solve during performance of works of these stages.

Estimation of own opportunities of the enterprise. The purpose of a stage - to determine opportunities of realization of variants of development of available market opportunities of the enterprise in view of the available equipment, technology, sources of supply by raw material, site etc.

During achievement of the purpose the following tasks are solved:

1. The analysis of market condition, that has developed, and prospects of its development.

2. Revealing and estimation of potential opportunities of the basic competitors.

3. The analysis of technical and economic opportunities of the analyzed enterprise in comparison with the basic competitors.

Definition of principles and factors of segmentation. The purpose of a stage - definition of principles of segmentation, allocation of the factors of segmentation and their meanings, and also most probable combinations of the factors in view of their meanings.

Tasks, which solve for achievement of an object in view.

1. The analysis of opportunities of development, data on selling for the past periods of managing, items of information of bodies of state statistics, branch structure of the consumers, geographical distribution of the market etc.

2. A choice of principles, kind and factors of segmentation (on the basis of the executed analysis).

3. Definition of the most acceptable meanings (replaceable) factors of segmentation and degree of their differentiation.

4. Revealing of best of combinations of the factors.

Construction of matrix models (functional cards) for allocation and estimation of sites of the market by a method of segmentation on the consumers, products, basic competitors etc. the Purpose of a stage - construction of matrix models (functional cards) and their representation as the computer aided information systems (databases and appropriate software).

Tasks, which solve during achievement of an object in view.

1. Development of breadboard models of the forms of functional cards (on the basis of results of a previous stage).

2. Transformation of functional cards to a kind of matrixes (tables), representation them as computer databases. The development of the software or (more probable) a choice of system management of databases (for example, Open Excess or anyone another), in which environment will be analyzed.

The tax and analysis of the information, which characterizes the markets of selling. The purpose of a stage - tax and analysis of the information, filling of tabulared (matrix) models by the fact sheet.

Tasks, which solve during achievement of an object in view.

1. Revealing of sources, methods and ways of the tax of the information.

2. Development of the questionnaire (if necessary).

3. The tax of the necessary data and their ordering.

4. The analysis of the data.

5. Filling of models by the fact sheet.

Allocation of segments of the market and their complex estimation. The purpose of works of a stage - allocation of segments of the market and their estimation on all set of criteria, which are considered in a complex.

Tasks, which solve during achievement of an object in view.

1. The analysis of tabulated (matrix) models and allocation of segments of the market.

2. An estimation of segments by separate criteria from all of their set.

3. A complex estimation of segments by criteria.

Choice of target segments and development of the offers for acceptance of the administrative decisions. The purpose of works of a stage - definition of necessity performance of the following iteration (recurrence of process segmentation, since one of previous stages), or acceptance of the decision about end of process and choice of target segments.

Tasks, which solve during achievement of an object in view.

1. A choice of target segments.

2. Acceptance of the decision: to finish process or to repeat, since one of previous stages.

3. Development of the offers for acceptance of the administrative decisions by a management of the enterprise.

It is necessary to note, that each following iteration increases cost of works. General expenses for performance of works in view of following *i+1* iteration (only for a part works, which are carried out once again) are determined on formula:

$$Zc_{i+1} = Zc_i \cdot A \ , \tag{15}$$

where Zc_i - actually suffered expenses on previous i iteration; A - correction factor determined on the basis of similar works, carried out in the past periods of managing in similar conditions.

Thus, in a general view the circle of tasks is determined which are subject to the decision during allocation of sites of the market for realization of market opportunities of development.

The expenses for the decision of the allocated tasks in each concrete case different also depend on specificity of the enterprise, of a market situation etc. However in any case the general circuit of definition of expenses on works on search of variants of development remains such: definition of expenses on the decision of concrete tasks, and then account of their sum. It is necessary to note, that at performance of practical accounts for the concrete enterprise the insignificant changes of structure of tasks are possible.

II. An estimation of accuracy allocation of sites of the market for realization of the projects of development (estimation of accuracy segmentation for any of the allocated variants of development). Optimum are the segments which have the best integrated (complex) estimation on all set of known estimated criteria [8]: capacity of a segment (annual volume of selling in natural or cost expression); availability of trade channels (opportunity of the enterprise to receive trade channels of production); the tendencies of growth or reduction of a segment, whether they show it is necessary to focus work of the enterprise on the given segment; level of profit of work in a segment; sufficiency of resources for work in a segment; a degree of compatibility of a segment with the markets of the basic competitors (in what degree the basic competitors are ready to concede by the elected segment of the market?); chances of success in a competition.

For an estimation of accuracy of a choice of market positions on all sets of set forth above criteria, it is expedient to apply the following technique [7].

At first determine ranks of the allocated estimated criteria concerning a concrete market situation. For this purpose, expert method will carry out the analysis of criteria on a degree of their importance for an estimation of segments of the market of the concrete subject of economic activity in a concrete market situation, applying in pairs comparison (tab. 1).

The table 1 - Table ситуационного of the analysis of estimated criteria

Criterion	1	2	3	4	5	6	7	Together
1.Capacity of a segment		1	1	0	1	1	1	5
2.Availability of a segment	0		1	0	1	1	0	3
3. Tendency of growth	0	0		0	1	1	0	2
4.Level of profit	1	1	1		1	1	1	6
5.Degree of compatibility with the markets of the competitors	0	0	0	0		1	0	1
6.Chances in a competition	0	0	0	0	0		1	1
7.Presence of resources	0	1	1	0	1	0		3

System of estimation following: 0 - the criterion in column has overweight in comparison with criterion in a line; 1 - the criterion in a line has overweight in comparison with criterion in column [5]. The rank of criterion is determined by the sum of units in a line. The large sum answers higher rank.

Then ranks of criteria (sum of numbers) are translated in weight parameters (in particles of unit) under the following circuit:

- calculate the sum of numbers of all criterion ($S=\sum R_i$), for conditions of an example she(it) is equaled 21 ($S=21$);

- calculate the weight characteristics of any of criterion under the formula $(1/S)\cdot R_i$, for criteria in tab. 1, accordingly, we receive: 0,23; 0,14; 0,10; 0,29; 0,05; 0,05; 0,14.

The designed weight characteristics of criterion are used in the further analysis.

At the second stage it is carried out an estimation of the allocated target sites of the market (segments or "niches") on any of criteria separately on a known technique of the author [7]. For what, characterize (tab. 2) a degree of conformity of the allocated segments or niches of the market to estimated criteria. In column with numbers of criterion (or their names) against lines with the appropriate estimation put down marks, which show a degree of conformity of a segment to estimated criterion. System of putting down of estimations: on crossing of a line with an estimation on a serial scale and column with number of criterion write down numbers of sites of the market, which are analyzed (in the table the estimation by criteria only of two of them) is executed.

A relative estimation K_i of a site (segment or the niches) market on any of criteria determine behind the formula (16).

Table 2 — The allocated site of the market degree's of conformity to estimated criteria analysis

Estima-tion	A serial scale	Criterion						
		1	2	3	4	5	6	7
4	Corresponds completely	2		1				
3	Probably corresponds	1				2		1,2
2	Vaguely		1, 2		1, 2		2	
1	Probably doesn't correspond			2			1	
0	Completely doesn't correspond					1		

$$K_i = \frac{P_i}{P_{\max}}, \qquad (16)$$

where P_i - estimation of a site of the market on i criterion; P_{max} - the greatest possible estimation (in this case is 4).

At the third stage carry out an estimation of accuracy allocation of sites of the market on all complex of taken into account estimated criteria (tab. 3).

In column of the appropriate sites of the market opposite to any of criteria put an estimation, which is designed as product of a relative estimation (designed in tab. 2) on the weight characteristic of the appropriate criterion.

A final estimation of accuracy allocation of sites of the market carries out on the sum of estimations by all criteria. With the help of the given technique determines an integrated (complex) estimation of accuracy allocation of target sites of the market on all complex of estimated criteria ($0 \leq K \leq 1$), thus reduce together qualitative and quantitative estimations by separate criteria.

On size of an integrated estimation K it is possible to judge accuracy (quality) of process of segmentation (than closer K to 1, the above accuracy), that is - about accuracy of a market position. That is about accuracy of allocation of sites of the market (segments or niches) for formation on their basis of the target market for realization of the revealed market opportunities.

Table 3 — The complex estimation of sites of the market allocation's accuracy

Criterion	Sites of the market		
	1	2	3
Level of profit	0,145	0,290	0,218
Capacity	0,173	0,173	0,230
Availability	0,070	0,070	0,070
Presence of resources	0,105	0,105	0,035
The tendencies of growth	0,100	0,025	0,025
Chances of success in a competition	0,000	0,000	0,038

Degree of compatibility with the competitors' markets	0,013	0,013	0,025
Total estimation (*Kc*)	0,606	0,676	0,641

III. ***Definition of an accuracy's economically effective level***. In view of stated above, estimation of accuracy of works of alternative variants formation of the target market conduct comparing their integrated estimations. The advantage has that set of segments, which has higher integrated estimations.

On the other hand, as is marked above, the process of a choice of market positions is considered by the enterprise as multilevel iterative. After each iteration is analyzed: to repeat works of process at the following level equal to approximation or to finish them? Each following iteration increases cost of repeated works, the increase of accuracy of segmentation sharply increases expenses, which can exceed expected benefits from exacter definition of target segments and formation on their base of the target market. Therefore it is necessary to determine that optimum level of accuracy, which excess conducts to increase of general expenses (fig. 4).

But at the given stage it is heavy to determine expenses of work on generated on the basis of its allocated sites (segments or niches) target market of the enterprise. However it is quite natural to make the assumptions, that the increase of accuracy of a market position reduces these expenses.

The dependence between the size of the target market formation expenses (formation of a marketing network, system of the goods flow, system of stimulation etc.) on the basis of its allocated target sites (segments or niches) in inverse proportion depends on accuracy of performance of process of a market position. This dependence can be described by the following equation:

$$\frac{dz}{dk} = Z - r \cdot \frac{Z}{K} = Z \cdot \left(1 - \frac{r}{K}\right), \qquad (17)$$

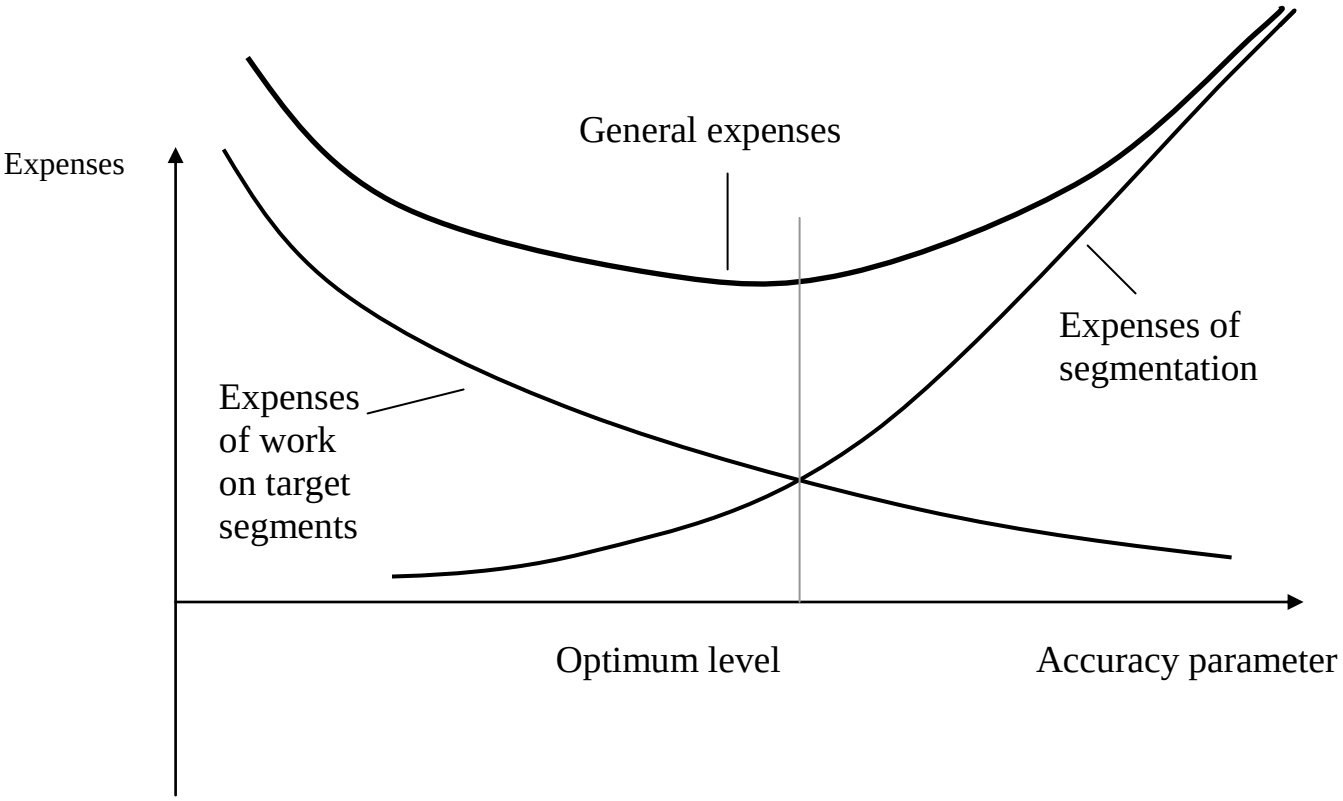

Fig. 4 — The optimum level's of market position accuracy definition

where Z - expense for work in the given target market or its site; K - parameter of accuracy of a choice (integrated estimation); r - factor of proportionality.

The size K is determined according to a technique stated above. As is marked above, integrated estimation K theoretically accepts meaning from 0 up to 1, however sites of the market (segments or niche of the market), which have an integrated estimation less than 0,5 to consider as target is inexpedient. Thus, K can change in limits (0,5-1,0).

Factor *r* can be determined in such a way. Let known meanings Zi at known Ki, for example, from the similar works, which have been carried out in the past periods of managing in similar conditions (*i*= 1, 2, 3..., n). Let's copy the equations (17), having transformed it to a kind convenient for the following analysis:

$$\frac{\Delta Z_i}{\Delta K_i} = Z_i - r \cdot \frac{Z_i}{K_i}, \qquad (18)$$

Accepting ΔK_i=0,01, after transformations is received

$$\Delta Z_i = 100 \cdot Z_i \cdot \left(1 - \frac{r}{K_i}\right). \quad (19)$$

For definition of factor r we use a method of the least squares:

$$\sum_{i=1}^{n} \left[\Delta Z_i - 100 \cdot Z_i \cdot \left(1 - \frac{r}{K_i}\right)\right]^2 \to \min. \quad (20)$$

By differentiation (20) on r we shall receive

$$200 \cdot \sum_{i=1}^{n} \frac{Z_i}{K_i} \cdot \left[\Delta Z_i - 100 \cdot Z_i \cdot \left(1 - \frac{r}{K_i}\right)\right] \to 0. \quad (21)$$

Having solved (21) rather r, previously having substituted known Zi and Ki, determine meanings r.

For definition Z we solve the equations (17), previously having transformed it to a kind

$$\frac{dz}{Z} = \left(1 - \frac{r}{K}\right) \cdot dk. \quad (22)$$

Decision of this equation:

$$\ln|Z| = K - r \cdot \ln|K| + \ln|C| \text{ Or}$$

$$Z = \frac{C \cdot e^K}{K^r}. \quad (23)$$

Marks of the module lowered, as the sizes Z and K accept only positive meanings.

Constant C it is possible to find if to substitute in the equation (23) known meanings Z and K, for example, whether Z_i and K_i or Z_n and K_n, received as a result of the analysis of processes of segmentation executed in the past periods of managing in similar conditions, and to solve it rather C. For example:

$$C = \frac{Z_i \cdot K_i^r}{e^{K_i}}. \qquad (24)$$

Thus received analytical dependences (21) - (24), are suitable for account of size of expenses, sufficient for formation of the target market on the basis of its allocated target sites depending on accuracy (quality) of their allocation (accuracy of a market position).

The size of common expenses on allocation of target sites of the market and formation of the target market on their basis can be calculated in such a way:

$$Zcy = Zc + Z. \qquad (25)$$

The optimum level of accuracy is set by a condition

$$Zcy \rightarrow min. \qquad (26)$$

For practical accounts for definition of an optimum level of accuracy of process of a choice of market positions (formation of the target market on the basis of target segments or niches of the market for realization variants of development of market opportunities of the enterprise, thus the process is considered as multilevel iterative, the following algorithm is offered.

1. Allocation of target sites (segments or niches) market on a known technique of the author [7].

2. Definition of an integrated estimation K of accuracy of process of allocation anyone, from all of their set, target sites of the market (degree of conformity of the allocated segments to estimated criteria).

3. Account of the actually suffered expenses on realization of works on a market position, that is search of target sites of the market.

4. Account forecast of size of expenses on realization of works on the allocated sites of the market (23).

5. Account of common size of expenses on formation of the target market and work on it (25).

6. Definition of expediency performance of the following iteration for exacter allocation of a set of target sites of the market. In turn, includes the following stages.

6.1. Forecast estimation of expenses on realization of works, which are necessary repeatedly for executing (after entering respective alterations), as products of the actually suffered expenses on performance of these works on size of correction factor A (15), which size is specified in process of accumulation of the data.

6.2. Forecasting of meaning of an integrated parameter of accuracy of a market position expected after probable following iteration.

For reception of dependence of a probable gain of an integrated parameter K from quantity of iterations it is necessary carry out special researches or to accept it at a level of similar works on the segmentation which has been carried out in the past periods of managing in similar conditions. In forecasting accounts, at absence of the mentioned above data, the meaning of an integrated parameter K is possible to expect till the following empirical formula (for second and following iterations):

$$K_{i+1}=K_i\left(1+\frac{1}{10\cdot i^2}\right), \qquad (27)$$

where Ki - meaning of an integrated parameter determined after previous i iteration.

If designed $K_{i+1} > 1$, accept $K_{i+1} = 1$.

6.3. On the basis forecasting meaning of a parameter of accuracy (K_{i+1}) the expected size of expenses on work on the allocated sites of the market (Z_{i+1}) under the formula (23).

6.4. The expected size of total expenses under the formula (25) - $Zсум_{i+1}$ pays off and is compared with actually designed $Zсум_i$. If $Zсум_{i+1} < Zсум_i$, the following iteration to carry

out expediently, if $Zсум_{i+1} \geq Zсум_i$ (criterion of end), process of allocation of target sites of the market finish.

The given approach and appropriate methodical device permit to find an optimum parity between a level of accuracy of search of target sites of the market by a method of segmentation, which is considered as multilevel iterative process, and also expenses for process of formation of the target market on the basis of its allocated target sites (formation of a marketing network and systems of a flow of the goods, system engineering stimulation etc.). And it, in turn, enables to allocate the target markets or their sites for development of market opportunities of the concrete enterprises in concrete conditions of managing, spending on it there are a lot of means, how many it is necessary, not supposing their over expenditures. Effectively operate processes of search by the enterprises of the place in the market for realization of their potential in existing external conditions in view of prospects of their development.

Not applying on it is necessary to note settling depth of the analysis, that the stated above approaches applied in a complex permit to solve a problem of definition of a necessary and sufficient level accumulation of the information for management of development of market opportunities of the enterprises at a stage of formation of the target market for their realization. They can be accepted for a basis at performance of similar development for other stages of this process.

The further development should be directed on development of formal procedures of definition of a necessary and sufficient level accumulation of the information (on volumes and kinds) for a substantiation of a choice of directions of development of market opportunities of the enterprises.

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